

# Heat Delay in Poinsettias

With new varieties gaining popularity, University of Florida researches sensitivity to heat delay and how to deal with it.

By Jim Barrett

**W**hile 'Freedom Red' was the most important poinsettia variety in most of the country over the past 10 years or so, heat delay was not a topic that was discussed very much. However, with 'Prestige' becoming such a popular variety, we are hearing about it again, and a refresher in heat delay and how to deal with it seems in order.

Heat delay refers to high temperatures delaying flowering. Flowering in poinsettias refers to two separate physiological processes: the first is initiation of the true flower (cyathia), and the second is development of color in the bracts. Both require short days, but color development requires a slightly longer dark period (shorter day). High temperatures can delay either or both flowering processes, and in normal production situations both are usually affected. A grower may see a separation of the processes if plants are initiated and then moved to a hot area, such as hung up in a hot greenhouse or near a

main heat line. In this type of situation plants may form a visible flower bud well before color starts and finish with fewer bracts developing color.

## HEAT DELAY EXPERIMENTS

Last fall, we conducted a study to compare the effects of heat delay on 10 poinsettia varieties. The plants were started under long-day lighting to prevent early initiation and were held in the same house. Then, on September 25, 2003 the plants were moved into two houses. One was a high-temperature house with an average night temperature of 74° F and day temperature of 82° F. The other was a medium-temperature house where the lowest night temperatures ranged from 65-69° F and the average night temperature was 70° F. The average day temperature was 73° F in the medium-temperature house. On September 29 the long-day lighting was terminated, and the plants were given natural days. ▶

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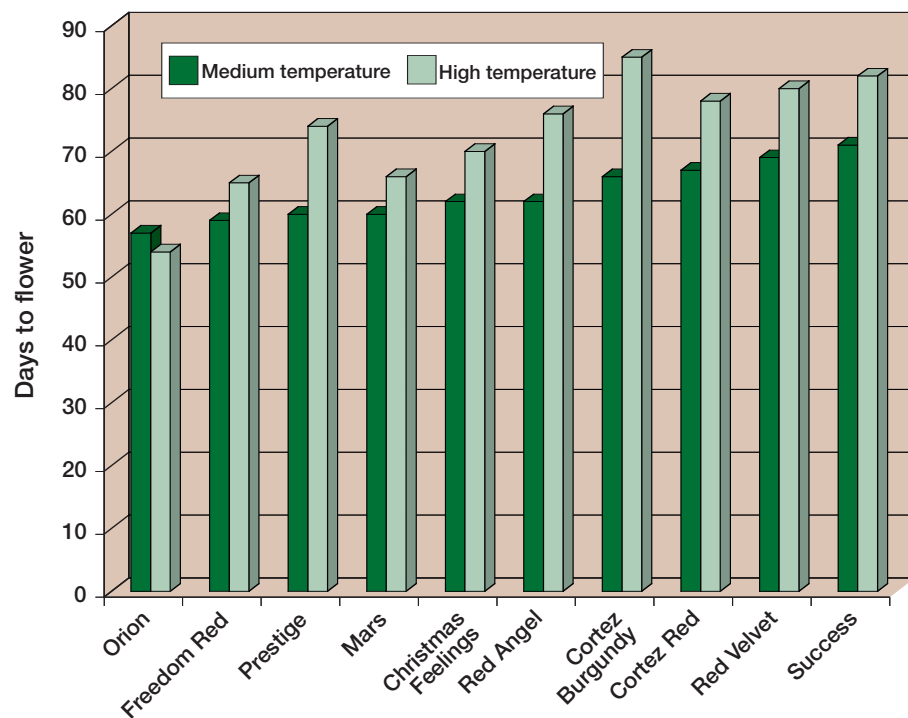
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Figure 1. Days to flower under natural days.



The plants were held under these conditions for four weeks and then moved together in one house. The plants were finished with minimum night temperatures of 66° F and days from 75-80° F. So differences in the plants were due to the temperatures during the time of flower initiation and onset of color development.

Flowering was considered to be when the first cyathia showed pollen on each plant. The time to flower from start of natural days for the 10 varieties is shown in Figure 1, below, and time to first color is given in Figure 2, page 76. In the graphs, note the differences between the medium- and high-temperature houses for each variety. This is the amount of heat delay.

Freedom Red was delayed by 6-7 days by the high temperatures, which is a relatively small delay compared to other varieties. This fits the pattern we see in commercial production where Freedom will vary by about one week from year to year, depending on temperatures during the initiation period. On the other hand, Prestige showed first color 11 days later and finished 14 days later due to the



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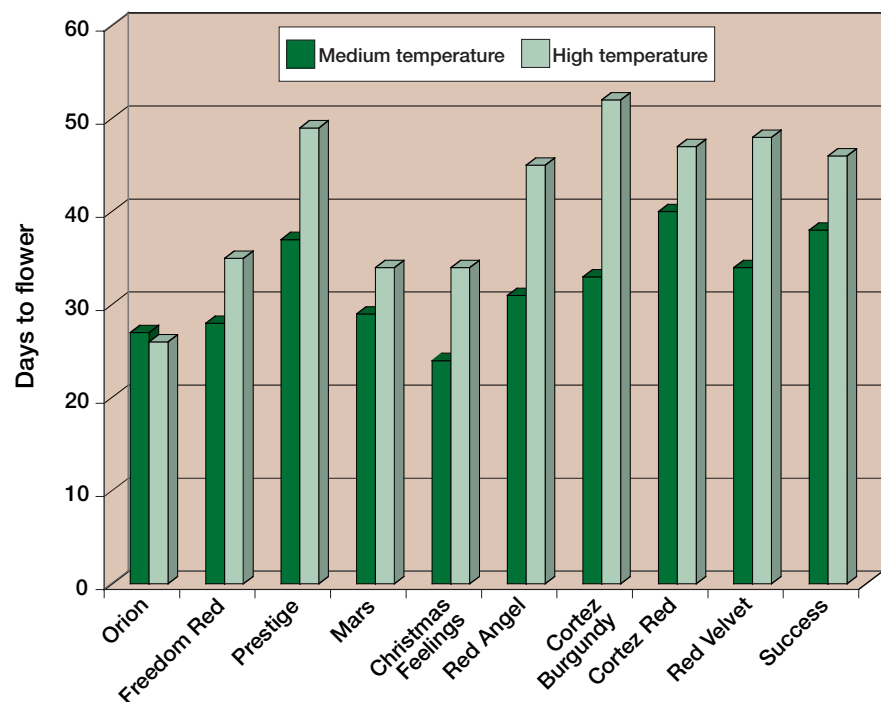
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Figure 2. Days to first color under natural days.



high temperatures during the initiation period. This sensitivity to heat delay is similar to what we experienced with the older 'V-14' and 'Annette Hegg' varieties.

Orion is interesting. Note that the plants given high temperatures for four weeks actually started color and finished earlier. This is because Orion is not sensitive to heat delay, and the plants in both greenhouses initiated at the same time. After initiation, the higher-temperature plants developed faster than the ones at medium temperatures. One of the reasons Orion has become an important variety for Southern growers is that it is uniformly early each year.

Mars and 'Christmas Feelings' are two new varieties that appear to be less sensitive to heat delay than average. 'Red Angel' and 'Cortez Burgundy' are newer varieties that seem to be more sensitive to heat delay.

The finish timing of Prestige and other varieties sensitive to heat delay is more predictable in cooler climates where they are not delayed and in the warmest climates where they are uniformly later. In most of the East, Texas through the Southern plains and warmer areas of the West, greenhouse temperatures during late September and early October vary from year to year. This can potentially cause Prestige to vary by up to two weeks in finish timing. Growers in these regions may find that varieties sensitive to heat delay finish at different times in their cooler and warmer houses.

Figure 3, page 76, shows plants in the same medium- and high-temperature houses that were given 13-hour nights using black cloth. The dark period under natural days is about 11½-12 hours at the time of year when the study was conducted. Providing a slightly longer dark period (a shorter day) overcomes the heat day effect. Notice in the article on page 26 how this is similar to the effect seen in calibrachoa, a long-day plant, where a shorter dark period (longer day) negates the

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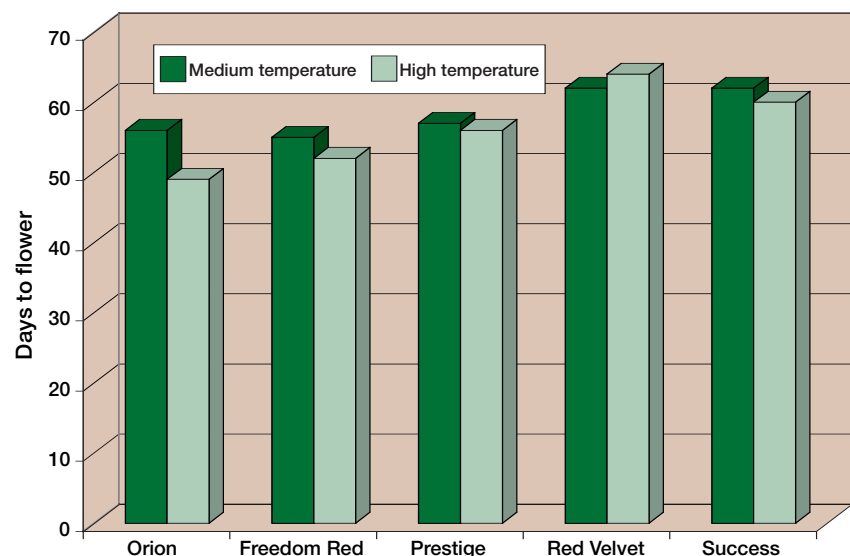
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Figure 3. Days to flower under 13-hour nights.



effect of higher temperatures at initiation. ▶

### HEAT DELAY SOLUTIONS

Where heat delay is a significant problem one potential solution is to black cloth the crop for 3-4 weeks, until temperatures are cooler and nights are longer. Also, heat delay is not typically a problem for growers who use black cloth to time crops. However, it can be a factor where growers use lights and then natural days.

Most growers do not have the capability of using black cloth to provide a longer dark period. So, for most growers who have problems with heat delay on varieties like Prestige or Cortez Burgundy they should think of temperatures during two phases of the crop. The first is from about September 20 until October 15, and the second is after first color. Sensitive crops should be in the coolest area available during the initiation period. In some areas it would be best to have sensitive crops outside under shade. If possible, run exhaust fans into the night to cool the house as much as possible. Also, poin-

settia baskets should not be hung too early in hot greenhouses.

For a crop that has been delayed some by high temperatures during initiation, the plants should be in a warm area after color development starts. This will bring them in faster. It is very important to prevent the average greenhouse temperature from dropping near the end of the crop.

Night temperatures are more important in heat delay than are day temperatures. Beyond that, however, the details of temperature effects are not very clear. Some suggest that night temperatures above 73° F will cause delay, and others suggest 70° F. Recently, I heard evidence from Italy that temperatures above 68° F will have an effect. We also do not know if one part of the night is more important than another.

Personally, I feel that there is a difference between a 68° F night in a cooler climate where the greenhouse cools off quickly in the evening and stays near 68° F most of the night and a 68° F low temperature in a warm climate where the greenhouse stays warmer through most of the night and only reaches 68° F just before sunrise. Plants in the second situation will initiate later than ones in the first situation. Going out on a limb a little here — there is probably a relationship between average night temperature starting at about 66 or 67° F and the time to initiation and first color. As the average night temperature increases to about 73° F, initiation and color are progressively delayed, with some varieties showing noticeable effects at temperatures lower than others. <sup>[GPN]</sup>

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